

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An intake system of an internal combustion engine, comprising:

a collector fixedly connected directly to either at least one of a side wall of a cylinder head and a collector mounting bracket hermetically covering perimeters of intake-port opening end portions of a plurality of intake ports opening through the side wall;

a plurality of intake-manifold branches respectively communicating with the plurality of intake ports and protruded into an interior space of the collector;

a variable valve actuation system that continuously variably adjusts a valve lift characteristic of an intake valve, the variable valve actuation system comprising a first variable valve actuation mechanism capable of continuously variably adjusting the working angle and the lift of the intake valve;

a control unit configured to be electronically connected to the variable valve actuation system for variably controlling an intake-air quantity through the variable valve actuation system;

wherein the first variable valve actuation mechanism comprising comprises:

a drive shaft [[,]] :

an eccentric cam driven by the drive shaft [[,]] :

a first link fitted to an outer periphery of the eccentric cam to permit relative rotation of the first link to the eccentric cam [[,]] :

a control shaft arranged parallel to the drive shaft having and comprising a control cam whose axis is eccentric to an axis of the control shaft [[,]] :

a rocker arm fitted to an outer periphery of the control cam to permit relative rotation of the rocker arm to the control cam, wherein the rocker arm is [[and]] connected at one end to the first link so that an oscillating motion of the rocker arm is produced through the first link [[,]] ; and

a rockable cam rotatably supported on the drive shaft, [[and]] connected to the other another end of the rocker arm via a second link, and [[being]] configured to be in abutted [[-]] engagement with a valve lifter of the intake valve so that the valve lifter is pushed by cam action of the rockable cam oscillating through the rocker arm; [[and]]

wherein the working angle and the lift of the intake valve are simultaneously adjusted by varying a center of rotation of the control cam of the control shaft.

2. (Original) The intake system as claimed in claim 1, wherein a vertical dimension of the collector measured substantially along the side wall of the cylinder head is dimensioned to be longer than a horizontal dimension of the collector measured in a direction substantially perpendicular to the side wall.

3. (Currently Amended) The intake system as claimed in claim 1, further comprising [[:]] an intake-air inlet through which intake air is introduced into the collector [[; and]] , wherein the intake-air inlet [[being]] is substantially centrally located in a cylinder row direction with respect to the intake-manifold branches.

4. (Currently Amended) The intake system as claimed in claim 1, further comprising [[:]] an air cleaner being built in the collector.

5. (Currently Amended) The intake system as claimed in claim 4, wherein [[:]] the air cleaner is laid-out configured to be offset from a direction [[that]] in which each of the intake-manifold branches is protruded into the interior space of the collector.

6. (Currently Amended) The intake system as claimed in claim 4,
wherein [[:]] the collector comprises upper and lower collector portions detachably connected to each other and sandwiching the air cleaner between them; and
wherein the air cleaner is located above a branch opening end portion of each of the intake-manifold branches.

7. (Currently Amended) The intake system as claimed in claim 4, wherein [[::]] a bottom surface of the collector is downwardly inclined toward the intake-air inlet through which intake air is introduced into the collector.

8. (Canceled)

9. (Currently Amended) The intake system as claimed in claim 1, further comprising [[::]] a pressure control valve located upstream of the collector and connected to each of the intake ports to create a vacuum needed for the engine.

10. (Currently Amended) The intake system as claimed in claim 9, wherein [[::]] during full load operation of the engine, an opening degree of the pressure control valve is increased and the pressure control valve is operated at its full-open operating mode so that a vacuum in the collector is reduced to a minimum.

11. (Currently Amended) The intake system as claimed in claim 9, wherein [[::]] the pressure control valve comprises a mechanical collector-vacuum feedback control mechanism [[whose]] having a valve opening that is automatically adjusted in response to the vacuum in the collector so that the vacuum in the collector is brought closer to a desired vacuum pressure value.

12. (Currently Amended) The intake system as claimed in claim 9, wherein [[::]] the intake system is configured so that blow-by gases escaping into a crankcase of the engine are recirculated into a downstream side of the pressure control valve.

13. (Currently Amended) The intake system as claimed in claim [[9]] 4, wherein [[::]] the intake system is configured so that blow-by gases escaping into a crankcase of the engine are recirculated into a downstream side of the air cleaner.

14. (Currently Amended) The intake system as claimed in claim 1, wherein [[::]] in a middle load range of the engine, an intake valve open timing of the intake valve is set to be phase-retarded with respect to an exhaust valve closure timing.

15. (Currently Amended) The intake system as claimed in claim 14, wherein [[::]] at least a portion of an intake-system component part constructing creating an intake-air passage connected to each of the intake ports is made of a synthetic resin material.

16. (Currently Amended) The intake system as claimed in claim 14, wherein [[:]]
in the middle load range, the exhaust valve closure timing is set to be phase-retarded with respect to a top dead center position.

17. (Currently Amended) The intake system as claimed in claim 14,
wherein [[:]] in the middle load range, the exhaust valve closure timing is set to be phase-advanced with respect to a top dead center position, and
wherein, in the middle load range, additionally a time period from the top dead center position to the intake valve open timing is set to be longer than a time period from the exhaust valve closure timing to the top dead center position.

18. – 19. (Canceled)

20. (Currently Amended) The intake system as claimed in claim 1, wherein [[:]]
the variable valve actuation system further comprises a second variable valve actuation mechanism capable of continuously variably adjusting a phase of a central angle of the working angle of the intake valve.

21. (Currently Amended) An intake system of an internal combustion engine, comprising;

a collector fixedly connected directly to either at least one of a side wall of a cylinder head and a collector mounting bracket hermetically covering perimeters of intake-port opening end portions of a plurality of intake ports opening through the side wall;

a plurality of intake-manifold branches respectively communicating with the plurality of intake ports and protruded into an interior space of the collector; and

a recessed portion, which is provided to avoid an interference between the collector and a fuel injection valve that injects fuel spray into an associated one of the intake ports, and formed as a recess on an outer periphery of the collector.

22. (Canceled)

23. (Currently Amended) An intake system of an internal combustion engine, comprising:

a collector fixedly connected directly to either at least one of a side wall of a cylinder head and a collector mounting bracket hermetically covering perimeters of intake-port opening end portions of a plurality of intake ports opening through the side wall;

a plurality of intake-manifold branches respectively communicating with the plurality of intake ports and protruded into an interior space of the collector; and

a pressure control valve located upstream of the collector to adjust a vacuum pressure in the collector to a predetermined constant pressure value.

24. (Currently Amended) An intake system according to claim 21, wherein the recessed portion extends around two opposite sides and [[the]] a top of the fuel injection valve.

25. (Canceled)

26. (Currently Amended) An intake system according to ~~claims~~ claim 23, wherein during full load operation of the engine, an opening degree of the pressure control valve is increased and the pressure control valve is operated at its full-open operating mode so that a vacuum in the collector is reduced to a minimum.

27. (Previously Presented) The intake system of claim 1, wherein the collector is integrally formed with a substantially cylindrical intake-air inlet.

28. (Previously Presented) The intake system of claim 1, further comprising a gas passage adapted to place a portion of a crankcase of a cylinder block in fluid communication with the collector.

29. (Previously Presented) The intake system of claim 1, further comprising a second variable valve actuation system that only controls exhaust valve phase.

30. (Previously Presented) The intake system of claim 29, wherein an intake valve open timing is independent of an intake valve closure timing.

31. (New) The intake system of claim 21, further comprising said fuel injector valve located externally to the collector.

32. (New) An intake system of an internal combustion engine comprising an intake valve and a variable valve actuation mechanism, the variable valve actuation mechanism comprising:

a drive shaft;

an eccentric cam driven by the drive shaft;

a first link fitted to an outer periphery of the eccentric cam to permit relative rotation of the first link to the eccentric cam;

a control shaft arranged parallel to the drive shaft and comprising a control cam whose axis is eccentric to an axis of the control shaft;

a rocker arm fitted to an outer periphery of the control cam to permit relative rotation of the rocker arm to the control cam, wherein the rocker arm is connected at one end to the first link so that an oscillating motion of the rocker arm is produced through the first link;

a second link rotatably connected to another end of the rocker arm; and

a rockable cam rotatably supported on the drive shaft, rotatably connected to the second link, and configured to be in abutted engagement with a valve lifter of the intake valve so that the valve lifter is pushed by cam action of the oscillating rockable cam.

33. (New) The intake system of claim 32, wherein a working angle and a lift of the intake valve are simultaneously adjustable by varying a center of rotation of the control cam of the control shaft.

34. (New) The intake system of claim 33, wherein the variable valve actuation mechanism is capable of continuously variably adjusting the working angle and the lift of the intake valve.

35. (New) The intake system of claim 34, further comprising a control unit connected to the variable valve actuation mechanism and configured to variably control an intake-air quantity to the intake valve.

36. (New) The intake system of claim 35, further comprising:

a collector fixedly connected directly to at least one of a side wall of a cylinder head and a collector mounting bracket hermetically covering perimeters of intake-port opening end portions of a plurality of intake ports opening through the side wall; and

a plurality of intake-manifold branches respectively communicating with the plurality of intake ports and protruded into an interior space of the collector;
